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| 10/004,066      | 10/25/2001  | Steven J. Corak      | P04085US0           | 6709             |

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EXAMINER

LAIR, DONALD M

ART UNIT PAPER NUMBER

2858

DATE MAILED: 08/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/004,066

Applicant(s)

CORAK ET AL.

Examiner

Donald M. Lair

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-10, 12-28, 30, 32-50 and 52-63 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-10, 12-28, 30, 32-50, and 52-63 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
2. Claims 1 – 4, 6 – 10, 12 – 15, 22 – 28, 30, 32 – 50, and 52 – 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over “Trase Operating Instructions” or applicant’s admitted prior art, in view of Hunter et al. (US-5,893,218).
3. In regards to Claims 1 and 15, “Trace Operating Instructions” discloses a moisture monitoring device capable of deriving a moisture content of a porous media by time domain reflectometry (Sections 2.1 – 2.9). “Trase Operating Instructions” teaches that the TDR devices used by the applicant are capable of obtaining moisture content of porous media (Chapter 2) which would include grain and seed. The reference fails to disclose using the device to control the artificial drying process of the batch.
4. The Hunter et al. reference teaches an automatic seed dryer, *wherein automatic moisture sensors could be used to control the drying process (Column 8, lines 1 – 7)*. Further, the applicant discloses, on page 21 lines 3 – 11 of the specification, that the invention disclosed by Hunter et al. may be the drying system used by the applicant’s invention.
5. Since Hunter et al. explicitly state that an automatic moisture sensor may be used to control the drying system disclosed by Hunter et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the automatic moisture

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sensor disclosed in “Trase Operating Instructions” with the drying system taught by Hunter et al. and to use moisture readings obtained from the TDR to control the drying system for the purpose of eliminating the need for an operator to manually take samples from the drying chambers.

6. In regards to Claims 2 – 4, “Trase Operating Instructions” discloses that the Trase TDR device stores a plurality of sequential soil moisture readings (Section 7-5). Since the purpose of the Trase TDR device is to monitor the moisture levels of porous media, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the sequentially stored data as a means to determine the drying rate of the porous media, for the purpose of establishing when the porous media will be adequately dry by comparing the current moisture content to the desired moisture content.

7. In regards to Claims 6 – 10, “Trase Operating Instructions” teaches that the TDR devices used by the applicant are capable of obtaining moisture content of porous media (Chapter 2) and the applicant discloses as prior art, on page 9 lines 13 – 20 of the application, that TDR is relatively insensitive to composition of the non-liquid components of the material, and that seed and various types of corn qualify as said porous media. Therefore, it is inherent that the TDR device disclosed in “Trase Operating Instructions” is capable of obtaining moisture content measurements for the various porous media claimed by the applicant.

8. In regards to Claims 12 – 14, 22 – 28, 30, 32 – 50, and 52 – 63, the disclosure of “Trase Operating Instructions” teaches all the functions described above, but fails to teach any specific testing chambers.

9. The Hunter et al. reference teaches an automatic seed dryer, *wherein automatic moisture sensors could be used to control the drying process (Column 8, lines 1 – 7)*. Further, the

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applicant discloses, on page 21 lines 3 – 11 of the specification, that the invention disclosed by Hunter et al. may be the drying system used by the applicant's invention.

10. Since Hunter et al. explicitly state that an automatic moisture sensor may be used to control the drying system disclosed by Hunter et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the automatic moisture sensor disclosed in "Trase Operating Instructions" with the drying system taught by Hunter et al. and to use moisture readings obtained from the TDR to control the drying system for the purpose of eliminating the need for an operator to manually take samples from the drying chambers. It is implicit that this embodiment will include TDR probes at a plurality of different vertical heights, since the porous media dry at different rates, dependant on their vertical position, and that the manual operator must take samples from a plurality of different heights (Column 7, lines 21 – 59).

11. Claims 16 – 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Trase Operating Instructions" in view of Hunter et al. as applied to Claims 1 – 4, 6 – 10, and 12 – 15, and in further view of Hook (US-5,376,888).

12. In regards to Claims 15 – 21, the disclosure of "Trase Operating Instructions" in view of Hunter et al. teaches all the functions described above, wherein it is clear that the Trase device is capable of performing all of the TDR functions claimed by the applicant since this is the actual device used; however, the limitation of an impedance mismatch at the point of the electrical connection of the probe to a cable is not taught by this disclosure.

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13. Hook discloses an apparatus useful to the function of monitoring moisture levels in porous media, wherein he teaches positioning a probe in a bin/container, creating an impedance mismatch at the point of the electrical connection of the probe to a cable, sending a step function voltage pulse through the cable, and measuring the reflection of the pulse (Column 8, line 20 – Column 9, line 56).

14. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the TDR device disclosed in “Trase Operating Instructions” by creating an impedance mismatch at the point of the electrical connection of the probe to a cable as taught by Hook for the purpose of providing an identifiable impedance change at the probe terminus.

#### ***Response to Arguments***

15. Applicant's arguments with respect to claims 1 – 63 have been considered but are moot in view of the new ground(s) of rejection.

16. The Examiner will address the major points brought up in the Applicant's arguments. The claims appear to be directed to a combination of the drying bins disclosed by Hunter et al. and the TDR probes disclosed in “Trace Operating Instructions.” The following passage from Hunter et al. (Column 8, lines 1 – 7) clearly teaches an automated drying process enabled through the monitoring of the moisture of seed in the dryers:

*The present invention could also include various alternative or optional features. For example, rather than manually measuring the moisture of the seed in the dryers, automatic moisture sensors could be installed in bins 32 and 34 for sensing the amount of moisture during the drying process. The measured moisture would be used by the control system to assist in controlling the drying process.*

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17. While the Patent Statue states that methods are patentable even if they utilize known apparatus, the combination of known devices in this case, wherein TDR is widely used as a method of monitoring moisture content, was discussed in prior art that was available at the time of invention. To be concise, here is what the state of the art appears to have been at the time of invention:

- Hunter et al. (US-5,893,218), disclose an apparatus for drying agricultural porous material which is fully capable of being automated by using automatic moisture sensors for sensing the amount of moisture in the agricultural porous material.
- Hook (US-5,376,888) discloses a TDR for detecting moisture levels. The reference explicitly states that TDR may be used to monitor moisture content of moisture bearing mediums such as soil or grain (Column 2, lines 33 – 52).
- “Trase Operating Instructions” discloses a TDR device capable of monitoring moisture levels in moisture bearing mediums, such as soil.
- The Specification of the current application discloses in prior art discussion of TDR technology that “TDR is relatively insensitive to the composition of the non-liquid water components of the material. Such also is the case with seed corn and ear corn” (Specification: Page 9, lines 13 – 20).

18. It was clearly well known at the time of invention to automatically control the drying of agricultural porous material, wherein the drying apparatus is controlled based upon the moisture content of the porous material. It was further well known that the moisture content of agricultural porous material can be measured and monitored using TDR techniques and devices.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the

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invention was made to control the automatic drying device based on results obtained by a TDR moisture measuring device.

19. Further, the Applicant traversed the combination of "Trase Operating Instructions" and Hunter et al., however the Applicant merely stated that there is no suggestion to combine these two references. As shown above and in the prior office action (paragraphs 13 and 14), there is clearly motivation to combine them.

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

21. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



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***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donald M. Lair whose telephone number is (703) 305-4450. The examiner can normally be reached on Monday - Friday, 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on (703) 308-0750. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1436.



Donald M. Lair  
Patent Examiner  
Art Unit 2858  
August 12, 2003



N. Le  
Supervisory Patent Examiner  
Technology Center 2800